



# Update on the Governor's Greenhouse Gas Reduction Targets and Related Activities

March 23, 2006



# Comprehensive, Multi-Agency Effort

- Climate Action Team identified 44 recommended strategies
  - 11 already underway
  - 33 to be implemented
- Significant, ongoing ARB role



# Important Role for ARB

- Strategy development and implementation
  - Motor vehicle GHG reduction
  - 10 additional ARB strategies identified in Climate Action Team report
- Economic analysis
- Scientific research



# Motor Vehicle GHG Regulations

- Took effect January 1, 2006
- Litigation underway
- USEPA waiver requested
- Climate Action Team report recommends more stringent standards for 2017 and beyond



# Vehicle GHG Reductions

	2020 Reduction (MMT)	2030 Reduction (MMT)
Current regulation	30	51
Possible followup* (2017 and beyond)	4	27
Combined effect	34 (23% of 2020 target)	78

\*Based on assumed 50% reduction from 2002 baseline



# Potential Approaches for Additional Vehicle Reductions

- Significant HEV penetration after 2016
- Increased use of alternative fuels
  - Biofuels (biodiesel, ethanol)
  - Hydrogen
  - Electricity (plug HEVs)





# Scientific Evidence Continues to Mount

- Temperature trends in lower atmosphere
- Further evidence of glacial melting
- Human activities contributing to oceanic warming



# Temperature Trends in Lower Atmosphere

- Previous research showed discrepancies between warming near the surface and higher in the atmosphere
- Errors have been identified and corrected in satellite data and other observations
- Recent evidence has increased confidence in our understanding of observed changes and their causes





# Further Evidence of Glacial Melting



Glacier Bay National Park, 1941



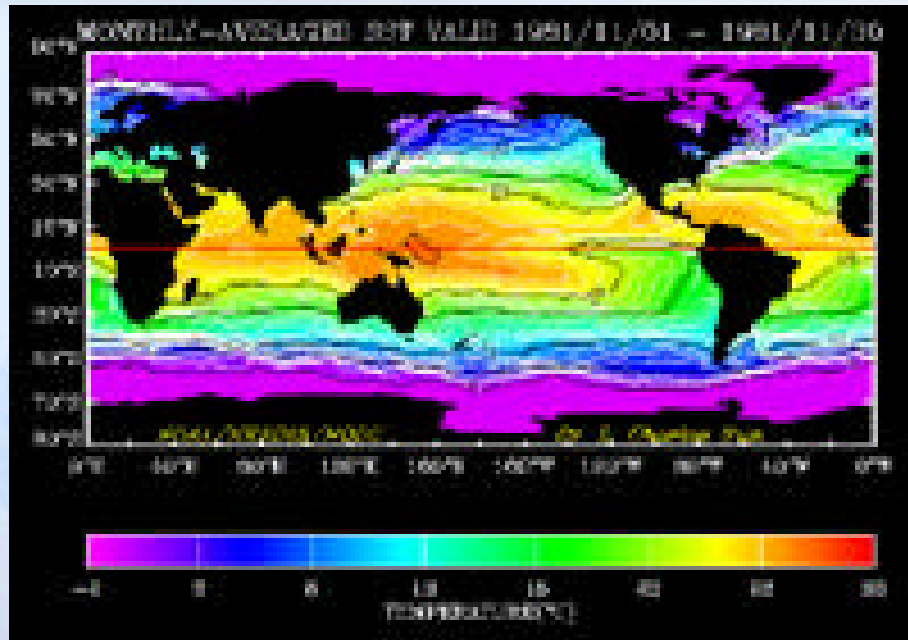
Glacier Bay National Park, 2004

Two recent studies with similar findings:

- Satellite surveys show that Antarctica is losing ice faster than it is replenished
- Subtle changes in Earth's gravitational field also indicate loss of ice



# Human Activities Contributing to Oceanic Warming



Study considers vertical warming of the oceans and the role of natural events (e.g. solar variability, volcanic activity)

- Warming cannot be explained by natural climate variability
- Concludes that oceanic warming is human-induced

Barnett, et.al., Science, V. 309, July 8, 2005



# Strategy Development (ARB Strategies)

	2010 (MMT)	2020 (MMT)
Vehicle climate change standards	1	30 <input checked="" type="checkbox"/>
Other new light duty vehicle technology improvements	0	4
Diesel anti-idling	1	1.2 <input checked="" type="checkbox"/>
HFC reduction	2.7	8.5
Transport refrigeration, off-road electrification, port electrification	<1	<1
Manure management	0	1



# Strategy Development (ARB Strategies)

	2010 (MMT)	2020 (MMT)
Semiconductor industry targets (PFC)	2	2
Alternative fuels: Biodiesel blends	<1	<1
Alternative fuels: Ethanol	<1	3.2
Heavy duty vehicle emission reduction	0	3
Reduced venting and leaks in oil and gas systems	1	1
Hydrogen highway	Included	Included





# Economic Analysis

- Preliminary analysis concludes that strategies will benefit CA economy
  - Increased jobs
  - Increased personal income
- Refined analysis to be completed later
  - Updated cost and savings estimates
  - Analysis of individual strategies
- ARB will support analysis of market based alternatives



# ARB Research Priorities

- Improve our ability to characterize impact of climate change on California
  - Biogenic emissions
  - Meteorology
  - Air quality





# ARB Research Priorities

- Improved tools to assess the economic impacts of GHG reduction strategies
  - Life cycle analyses
  - Market based approaches
- Studies to support identification and implementation of specific strategies



# Governor's Proposed Budget (ARB Climate Change Activities)

- 15.5 positions
  - Strategy development and implementation
  - Economic analysis
- \$3.25 million (one-time) in contract funding